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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/633,644	08/07/2000	Yu-Kung Hsiao	TSMC2000-085	3337

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EXAMINER

KANG, DONGHEE

ART UNIT PAPER NUMBER

2811

DATE MAILED: 06/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/633,644

Applicant(s)

HSIAO ET AL.

Examiner

Donghee Kang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-15 and 18-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-15 and 18-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 August 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 01 April 2003 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 29, 2003 has been entered.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the phrase "*forming a third planarizing layer on the second planarizing layer*" in claim 1, the phrase "*a second patterned color filter layer is formed with the second planarizing layer*" in claim 20, & the phrase "*a third patterned color filter layer is formed with the third planarizing layer*" in claim 21 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:

The disclosure does not include a Brief Description of the drawings 11-16: See MPEP §608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR1.74.

In amended disclosure, a color filter layer 11, as depicted in Figs. 7, 8, 9 and 17 (see page 5 line 4) is misdescriptive because there is no Fig.17.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims **1-3, 5-15 & 18-23** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Re claim 1:

the specification does not support the limitations "*forming a third planarizing layer on the second planarizing layer*". The specification only describes forming a second planarizing layer on the first patterned color filter layer but not the third planarizing layer.

Re claim 20:

The specification does not support the limitation "a second patterned color filter layer is formed with the second planarizing layer".

Re claim 21:

The specification does not support the limitation "a third patterned color filter layer is formed with the third planarizing layer".

Claims 2-3, 5-15, 18-19 & 22-23 are rejected because each includes the limitations of independent claim 1.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims **1-3, 5-6, 8-9, 11 & 18-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka (US 6,040,591) in view of Baek (US 6,127,668), and further in view of Sano et al. (US 5,514,888).

Re claim 1, Otsuka teaches a method of fabricating a semiconductor color imager having an optical structure, comprising (Fig.5):

a semiconductor substrate (11) having a matrix of imaging sensors (2) formed thereon, each image sensor having a photosensitive area and a complementary non-photosensitive area, said matrix of imaging sensors being organized in a plurality of subsets;

forming a first matrix of light shields (13) over the non-photosensitive areas of the matrix of imaging sensors;

forming a first planarizing layer (14) over the matrix of imaging sensors;

forming a first patterned color filter layer (15) on the first planarizing layer, said patterned color filter layer being registered with the photosensitive areas of a first subset of the matrix of imaging sensors;

forming a second planarizing layer (16) on the first patterned color filter layer;

patterning a layer of microlens material (17) to form a first matrix of microlenses over the second planarizing layer, said first matrix of microlenses being registered with the photosensitive areas in the matrix of imaging sensors; and

forming an overcoat layer (18) over the first matrix of microlenses, said overcoat layer having high transmittance, said overcoat layer providing patterned or uniform optical compensation between the subsets of the matrix of the imaging sensors; whereby the performance of the color imager is optimized. *See also Col.3, line 56 – Col. 4, line 15.*

Otsuka does not teach depositing a passivating coating encapsulating a metal photoshield layer. However, Baek teaches depositing a passivating coating (43) encapsulating a metal photoshield layer (42). *See Fig.3c & Col.3, line 61 – Col.4, line 7.*

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Baek into the Otsuka's device in order to protect the metal photoshield layer.

Neither Otsuka nor Baek teaches forming a third planarizing layer on the second planarizing layer. Sano et al. teach forming the third planarizing layer on the second planarizing layer (see Fig.1 & Col.1, line 39 – Col.9, line 35). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to

incorporate the teaching of Sano et al. into Otsuka's device as modified by Baek in order to optimize focal length of microlens.

Re claim **2**, Otsuka teaches the semiconductor substrate material is made of silicon.

Re claim **3**, Otsuka teaches the matrix of imaging sensors comprise CCD.

Re claim **5**, Otsuka teaches the overcoat layer is comprised of a negative type photoresist having refractive index adjusted to match the refractive index of the microlens material.

Re claim **6**, Otsuka teaches the overcoat layer is comprised of a patterned multiplayer stack (18 & 19) such that one or more color filters are thereby integrated with the overcoat material.

Re claim **8**, Otsuka teaches the elements of the first matrix of microlenses is comprised of hemispherical convex.

Re claim **9**, Otsuka teaches the microlens layer material is selected from the group of positive or negative conventional photolithographic materials.

Re claim **11**, Otsuka teaches the overcoat layer is comprised of a negative type photoresist to serve as a thermal barrier and protective encapsulant for a microlens layer material comprising a positive type photoresist.

Re claims **18-19**, Otsuka as modified by Baek does not teach a second & third matrix of light shields. Sano et al. teach the second (56) & third (58) matrix of light shields to prevent uneven sensitivity and blurred images. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to

incorporate the teach of Sano into the Otsuka's device since three light shielding layers along the optical paths transmitting through the lens, even not entering the photodiode and scattered in the interior does not result in the flare light invading the adjacent photodiode, whereby uneven sensitivity and blurred images never occur.

Response to Arguments

8. Applicant's arguments filed April 1, 2003 have been fully considered but they are not persuasive.

Applicant argues that Otsuka fails to teach the solid state image device including a multiple layer of light shields, the flexible formation of color filters etc....

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., flexible formation of color filters) are not recited in the rejected claim 1. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 703-305-9147. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Donghee Kang
Examiner
Art Unit 2811

dhk
June 19, 2003